SECTION 26 4123

LIGHTNING PROTECTION SURGE ARRESTERS AND SUPPRESSORS

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LANL MASTER SPECIFICATION

When editing to suit Project, author shall add job-specific requirements and delete only those portions that do not apply to the Project (e.g., a component that does not apply). To seek a variance from applicable requirements, contact the Engineering Standards Manual (ESM) Electrical POC. Refer to http://engstandards.lanl.gov/engrman/HTML/poc_techcom1.htm#elec for the Engineering Standards Manual Personnel Link Index.

When assembling a specification package, include applicable specifications from all Divisions, especially Division 1, General Requirements.

Delete information within “stars” during editing.

Specification developed for ML-3 / ML-4 projects. For ML-1 / ML-2, additional requirements and QA reviews are required.

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PART 1 GENERAL

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Edit the following article to match Project requirements. Delete materials not applicable to Project.

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1.1 SECTION INCLUDES

A. Secondary surge arresters (SSAs) on power circuits at facility entrances to protect the structure from lightning.

B. Surge protective devices on signal, data, and control lines at facility entrances to protect the structure from lightning.

1.2 LANL PERFORMED WORK

A. None

1.3 SUBMITTALS

A. Submit the following in accordance with Section 01 3300:

B. Catalog Data: Submit catalog data describing surge protective devices. Include data substantiating that materials comply with specified requirements.

1.4 QUALITY ASSURANCE

A. Comply with the *National Electrical Code* (NEC) and NFPA 780 *Standard for the Installation of Lightning Protection Systems* for components and installation.

B. Provide products that are listed and labeled by a Nationally Recognized Testing Laboratory (NRTL) for the application, installation condition, and the environment in which installed.

C. Manufacturer shall maintain an ISO 9000 certification.

D. Provide products suitable for use at a nominal altitude of 7500 ft.

1.5 RECEIVING, STORING AND PROTECTING

A. Receive, store, protect, and handle products according to NECA 1 *Standard Practices for Good Workmanship in Electrical Construction*.

PART 2 PRODUCTS

2.1 PRODUCT OPTIONS AND SUBSTITUTIONS

A. Alternate products may be accepted, follow Section 01 2500.

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Edit the following article to match Project requirements. Delete materials not applicable to Project.

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2.2 SECONDARY SURGE ARRESTERS

A. Provide secondary surge arresters (SSAs) suitable for the protection of the structure in accordance with NFPA 780 and NEC Article 280.

B. SSAs shall be listed in accordance with UL 1449 Second Edition *Standard for Safety, Transient Voltage Surge Suppressors*, with product category guide designation OWHX.

C. Provide SSAs that meet IEEE C62.11 *Standard for Metal-Oxide Surge Arresters for AC Power Circuits*, and IEEE C62.34 *Standard for Low Voltage Surge Protective Devices, Secondary Surge Arresters.*

D. Provide SSAs that use MOV technology and have visual indication of operational status.

E. Provide SSAs that have an internal fuse link that will open in the event of a sustained varistor-damaging over-voltage.

F. Provide SSAs with enclosure suitable for indoor or outdoor installation.

G. Provide SSAs for suitable for use on electrical systems with operating voltage(s) and number of poles suitable for the installation location(s) indicated on the Drawings.

H. Manufacturer: Square D “SDSA”, Joslyn “Surge Tec”, Cooper “Storm Trapper H.E.”

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Edit the following article to match Project requirements. Delete materials not applicable to Project.
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2.3 SURGE PROTECTIVE DEVICES FOR SIGNAL, DATA, AND CONTROL LINES

A. Provide surge protective devices suitable for the protection of signal, data, antenna, and control lines.

1. Select surge protective devices with consideration for aspects such as the frequency, bandwidth, voltage, and current of the signal, data, antenna, or other communications lines and to ensure that insertion losses introduced by the surge protective devices are within acceptable operational limits.

2. Coordinate selection of surge protective devices for signal, data, antenna, and control lines with owner of equipment that is served by the lines.

B. Provide surge protective devices for of signal, data, and control lines that provide both common mode and differential mode protection.

C. Provide surge protective devices for signal, data, control, and alarm lines.

1. Devices shall be listed in accordance with UL 497B *Standard for Safety Protectors for Data Communications and Fire Alarm Circuits.*

2. Provide devices with ratings and connectors as required by the application.

3. Manufacturer: Phoenix Contact, EDCO, MCG Electronics

D. Provide coaxial surge protective devices for antenna and RF signal lines.

1. Devices shall be listed in accordance with UL 497C *Standard for Safety Protectors for Coaxial Communications Circuits*.

2. Provide devices with ratings and connectors as required by the application.

3. Provide bulkhead plates and low-impedance paths to ground where antenna cables enter the structure.

4. Manufacturers: TII Network Technologies, Inc, Cable Innovations, PolyPhaser

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify mounting area is ready for equipment.

B. Verify that circuit rough-in is at correct location.

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Edit article to match Project requirements. Delete materials not applicable to Project.
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3.2 INSTALLATION

A. Install surge protective devices where indicated on the Drawings and according to manufacturer's instructions and the *National Electrical Code*. Have the manufacturer’s installation instructions available at the construction site.

B. Install Secondary Surge Arrester(s) (SSA) in the service equipment to protect each ungrounded conductor on the line side of the service entrance disconnecting means.

C. Install SSA to protect each ungrounded conductor of power circuits that exits the structure to serve external detached equipment or other detached structures. Where such power circuits are longer than 100 ft install SSA to protect each ungrounded conductor at both ends of the circuit.

D. Install UL 497B listed surge protective device for each for signal, data, control, and alarm line that enters the structure or exits the structure to serve external detached equipment or other detached structures. Where such signal, data, control, and alarm circuits are longer than 100 ft install UL 497B listed surge protective device at both ends of the circuit.

E. Install UL 497C listed coaxial surge protective device for each for antenna and RF signal line that enters the structure or exits the structure to serve external detached equipment or other detached structures. Where such antenna and RF signal circuits are longer than 100 ft install UL 497C listed coaxial surge protective device at both ends of the circuit.

F. Install each surge protective device so it will be accessible for inspection and maintenance and so the condition monitoring indicator will be visible without requiring the removal of cover plates.

G. Install each surge protective device with minimum possible conductor length and a maximum conductor length of 18 inches.

1. Twist conductors tightly together and keep runs as straight as possible with no sharp bends or kinks.

2. Use approved means to make connections from the surge protective device to conductors to be protected.

H. Provide low-impedance grounding for surge protective devices.

1. Use approved means to make connections from the surge protective device to the point where the electrical power system grounded conductor is bonded to the grounding electrode conductor.

2. If the surge protective device is more than 20 ft away from the electrical system bonding point, make one or more supplementary grounding electrode connections at the surge protective device location. Use the building “main grounding electrode ground bar”, “main grounding electrode ground bar extensions”, effectively grounded building structural steel, and grounded water pipes as supplementary grounding electrodes.

3. Do not use a lightning protection system down conductor to ground a surge protective device.

3.3 FIELD QUALITY CONTROL

A. Provide final protection and maintain conditions to ensure that coatings and finishes are without damage or deterioration at final inspection.

B. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

C. Repair damage to paint finishes with matching touch-up coating recommended by the manufacturer.

D. Verify that each surge protective device is correctly connected and that all condition monitoring indicators operate properly.

END OF SECTION

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Do not delete the following reference information.
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FOR LANL USE ONLY

This project specification is based on LANL Master Specification Section 26 4123 Rev. 0, dated February 24, 2006.